Self-heating can

A **self-heating can** is an enhancement of the common food can. Self-heating cans have dual chambers, one surrounding the other, making a self-heating food package.

In one version, the inner chamber holds the food or drink, and the outer chamber houses chemicals which undergo an exothermic reaction when combined. When the user wants to heat the contents of the can, a ring on the can - when pulled - breaks the barrier which keeps the chemicals in the outer chamber apart from the water. In another type, the chemicals are in the inner chamber and the beverage surrounds it in the outer chamber. To heat the contents of the can, the user pushes on the bottom of the can to break the barrier separating the chemical from the water. This design has the advantages of being more efficient (less heat is lost to the surrounding air) as well as reducing excessive heating of the product's exterior, causing possible discomfort to the user. In either case, after the heat from the reaction has been absorbed by the food, the user can enjoy a hot meal or drink.

Self-heating cans offer benefits to campers and people without access to oven, stove or camp-fire, but their use is not widespread. This is because self-heating cans are considerably more expensive than the conventional type, take more space, and have problems with uneven heating of their contents.

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The source of the heat for the self-heated can is an exothermic reaction that the user initiates by pressing on the bottom of the can. The can is manufactured as a triple-walled container. A container for the beverage surrounds a container of the heating agent separated from a container of water by a thin breakable membrane. When the user pushes on the bottom of the can, a rod pierces the membrane, allowing the water and heating agent to mix. The resulting reaction releases heat and thus warms the beverage surrounding it.[1]

The heating agent and responsible reaction vary from product to product. Calcium oxide is used in the following reaction:

$$CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(s)$$

Copper sulphate and powdered zinc can also be used, but this process is less efficient:

$$CuSO_4(s) + Zn(s) \rightarrow ZnSO_4(s) + Cu(s)$$

Anhydrous calcium chloride is often used as well. In this case, no chemical reaction occurs, instead the heat of solution is generated.

See also

- Flameless ration heater
- Beverage can
- Self-heating food packaging

References

1. Container with integral module for heating or cooling the contents - Patent 5461867 (http://www.freepatentsonline.com/5461867.html)

Books, general references

- Yam, K.L., "Encyclopedia of Packaging Technology", John Wiley & Sons, 2009, ISBN 978-0-470-08704-6

External links

- Single-serving coffee can heats itself (https://www.usatoday.com/money/industries/food/2004-12-19-self-heat_x.htm?csp=15)
- Will Self-Heating Coffee Be Cool? (http://www.fool.com/News/mft/2004/mft04122021.htm)
- BBC News Online - Hot drink can tested in Midlands (http://news.bbc.co.uk/1/hi/england/1603391.stm)
- An article with photos on disassembly (http://makezine.com/2008/02/29/wolfgang-puck-selfheating/)

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